

From ab4el.com Tue Aug 24 00:00:00 1994
From: K7YHA@aol.com
Subject: Antenna Experiments

A couple of days ago someone posted a VERY long mssg about some antenna experiments they had done. I downloaded this into a .log file and my computer ate it!

Whoever posted that mssg, can I beg you to do it again? There was some good, solid info about antennas and tuners in that tome....sure would like to get a copy of it.

72 Rich

From ab4el.com Tue Aug 24 00:00:00 1994
From: "John F. Woods" <jfw@ksr.com>
Subject: Re: Antenna experiments

> Assuming that the antenna is at one of the correct magic heights above
> ground*,

Whoops, left off my footnote:

* The notion that a "72-ohm dipole" is really a 50-ohm dipole when near ground is something of a folk notion. That should be true only at just about .18 wavelengths above (perfect) ground (and who knows where over the ground in one's back yard), and at .1 wavelength (~24 feet at 3.5MHZ!) it could be as low as 20 ohms (according to the chart in the Handbook). So, if you can't rely on a match to 50 ohm cable anyway, you might as well plan on using a transmatch!

> By the way - I stand corrected regarding tuner heating.
> Several people have mentioned noticable (and indeed
> catastrophic!) heating in some instances.

I have got to find out why xmh isn't revealing that there's still leftover stuff in the edit buffer. Maybe I'm just getting careless.

73, John, WB7EEL/1

From ab4el.com Tue Aug 24 00:00:00 1994
From: "John F. Woods" <jfw@ksr.com>
Subject: Re: Antenna experiments

> From: janderson@polycom.com
> o I don't think you'd ever see a 55 ohm "resistive" load
> looking into the 50 ohm transmission line, unless by
> chance the antenna had a just the right impedance (55
> ohms?), and we were at just the right spot along the
> transmission line where the impedance is resistive only,
> without any reactive component.

Right; the antenna would have to be presenting just the impedance that you would see if you took the given transmission line and terminated it with a 55-ohm resistor; whether this would ever happen in practice is a very good question, especially given the constraint that the antenna should be being trimmed down to being a 50-ohm halfwave dipole.

> o A question I'll pose, since I don't know the answer:
> in the above stated case, will maximum (though not
> OPTIMAL) power transfer occur at the SWR dip minimum
> (note: not 1:1)? I think it would, but I'm not sure.

The SWR dip minimum would be 1:1, since I was positing that the antenna itself was being adjusted for minimum SWR, rather than using a tuner. Assuming that the antenna is at one of the correct magic heights above ground*, it can be made to reach 50 ohms and match the 50 ohm coax. The advantage, for my artificial case here, is that at that point the feedline length is completely arbitrary, so if there exists a physical antenna that is slightly longer than a 50-ohm dipole (and at the same height) with an impedance that can be transformed to 55 ohms resistive by some length of 50 ohm coax, then this can be set up. In that case, the transmitter will deliver maximum power at 1.1:1 SWR, but the cable loss will be just a shade higher than what it could be at 1.0:1 SWR. (On the other hand, the graph in the Handbook indicates that the loss difference is negligible, so this may be something that would be difficult to impossible to measure even *with* lab grade equipment.)

> o Another note: many swr bridges (such as 4 port hybrids)
> use 50 ohm resistors connected to their "measurement"
> ports. Does that mean that the SWR readings are
> meaningless when meters such as these are used in
> non-50 ohm systems (such as a 55 ohm xmtr and antenna)?
> Or can we think of these resistors as being, say, two
> resistances in a 4-R bridge, and since the other two
> resistances are equal (that is, in this case, the
> source and antenna resistances - both 55 ohms),
> would we still measure the correct SWR?

Ah, but what is the correct SWR? A 50-ohm bridge in the middle of 50-ohm cable will correctly measure the SWR at that point in the cable, but tells only limited information about the load (which constant-SWR impedance circle

it is on, but not where on that circle), and nothing about the transmitter. (Indeed, remember that for _transmitters_, rather than signal generators, the "50-ohm output impedance" is a fiction; for a class C transmitter, the actual impedance presented to the output port will vary between 0 and infinity as the final transistor switches on and off.)

For a more extreme example, if you deliberately designed a rig with 450 ohm output (which I've actually toyed with doing to (slightly) simplify use of 450-ohm ladder line), then when the SWR meter reads 1:1, the transmitter is WAY off the ideal point on its load line; if you used a half-wave section of coax to match a genuine 450-ohm antenna to the transmitter, the SWR along the coax (if it were lossless) would be 9:1, but the transmitter would be happy as a clam, since it would see its designed impedance of 450 ohms. Of course, you'd be losing 3dB in the coax (on 20 meters, RG-58 coax), so it might be worth mismatching the transmitter (reducing its output a little) in order to reduce coax loss (hopefully more).

73, John, WB7EEL/1

By the way - I stand corrected regarding tuner heating. Several people have mentioned noticable (and indeed catastrophic!) heating in some instances.

- Jeff, WA6AHL

From ab4el.com Tue Aug 24 00:00:00 1994
From: Robert Cutter <bcutter@csn.org>
Subject: Colorado 14'er event

N5F0 suggested I share the following:

The Colorado 14'er Event is primarily a VHF/UHF one, however I will have my xtal xcvr on 14.060 on Mt. Lincoln (14,200 ft). Antenna supports have been a problem in the past but give a listen if you are around Sunday, 1550-1800z. The early shut-down is to get all participants off the peaks before afternoon electrical storms.

72, Bob KI0G

From ab4el.com Tue Aug 24 00:00:00 1994
From: JimN0OCT@aol.com

Subject: Danish for \$200 please...

I don't think this made it the first time I posted it.

Am going to Copenhagen from 28-31 August. If there are any Danish hams who would like to talk radio or QRP on Sunday, I will be looking for things to do from 0800 local time (when I land) on. If there aren't any great Danes that read this list, then I will be listening for all you Inet QRPheads on 40 meters with my sony 2010. Found out about this trip three days ago, didn't have time to get a license.

Later!

72 or so, Jim n0oct

From ab4el.com Tue Aug 24 00:00:00 1994
From: Adrian Weiss W0RSP English Department <AWEISS@charlie.usd.edu>
Subject: EGG ON MY FACE - Ingram's "whatever it is"

Hi gang:

I have to apologize for my previous two postings about Ingram's "whatever" antenna. Thanks to Kevin N7WIN for some details about the design and a ref. to a QST article. I still can't quite visualize it as a variety of "sleeve" or "bazooka". Will have to check the ref. At any rate, it goes to show that I shot off my mouth before doing "adequate research." Then again, a nice long thread developed.

1/73, Ade

From ab4el.com Tue Aug 24 00:00:00 1994
From: stark <mswmod@sage.unr.edu>
Subject: Re: EGG ON MY FACE - Ingram's "whatever it is"

Hi Kevin,

I came close to doing that last winter in Utah. Was on a mountain top setting up some cloud seeding generators for a NOAA experment and found that there was no antenna.

Pulled about 17" of center conductor w/insulation out of the braid. Taped the top of that to an "arm" sticking off the tower and taped the braid to the tower leg. Used tape at the junction where the coax was opened.

It ran just fine all winter. Have no idea what the swr etc was. Just did it!

Oh yea, it was using RG58.

73's, Ron

.....KU7Y.....
.....Monte "Ron" Stark.....
.....Sun Valley, Nevada.....

From ab4el.com Tue Aug 24 00:00:00 1994
From: Adrian Weiss W0RSP English Department <AWEISS@charlie.usd.edu>
Subject: Re: EGG ON MY FACE - Ingram's "whatever it is"

Hi John:

Thanks for commenting on N7WIMichael's ASCII drawing. I still have to see the QST article -- while you're xeroxing (if you have time), how about dropping me a copy of the diagrams? Something still isn't making sense although the sleeve concept is perfectly clear now from the drawing. I'm hung up on the coil and its supposed function. If the coil actually does "choke off" the r.f. on the "antenna" side of the coax, it will have to be presenting an infinite impedance at some point on the windings to the wave fed onto the outside of the shield at the feed point. What is the inductive reactance of a coil of this dimension on the operating band? I'd like to see a current distribution graph along the length of the whole run of coax.

The other side of the coin: the inside surface of the coax shield is also coiled into an inductor with the same impact -- or am I missing something here? Now that I think of it, so is the center conductor. What I'm probably missing: ??? it isn't actually an inductance because the shield isolates one turn from the next??? e.g., the center conductor of turn #2 does even know that turn #8 exists? However, the outside surface of the shield does form an inductor. What do you think?

But we're still left with the above problem: isolation and the impedance presented to the developing wave on the outside-surface of the coax half of the dipole. The wave going down the wire just hits an infinite impedance open circuit as at the end of any normal radiating element. Maybe something in the QST article can clarify why the author claims that the same end-of-element reflecting plane is created by the coil.

Oh boy... maybe this thing will make sense someday. The bazooka and sleeve designs I've seen do something drastic where this coil is.

Thanks again, 73, Ade

From ab4el.com Tue Aug 24 00:00:00 1994
From: xenolith@halcyon.com (Kevin Purcell)
Subject: Re: EGG ON MY FACE - Ingram's "whatever it is"

>> =====|||=====-----
>
>> Anyone tried one made from RF-174. It might make a excellent portable aerial.
>
>Light, yes, but fairly lossy: 100' of RG-174 at 14MHz loses about 4.5dB (you'd
>need, what, 66 feet, not including the bare center conductor part?).

I was thinking you'd make the extended bit from regular (cheap) bell wire.
So that would leave you with say 33 foot radiator and some lead-in say 30
feet would be a lot. Thats only about 1 to 2 dB loss at the most. I
wouldn't worry about that.

Kevin Purcell, N7WIM / G8UDP xenolith@halcyon.com 206/649-6489
Seattle dBug Mac Developers SIG organiser

From ab4el.com Tue Aug 24 00:00:00 1994
From: "John F. Woods" <jfw@ksr.com>
Subject: Re: EGG ON MY FACE - Ingram's "whatever it is"

> As I understood the specs, you would use 1/2 wavelength of
> coax (1/4 in "transmission line", 1/4 in the sleeved portion
> of the antenna), plus some extra for the coil portion. So
> for 20m, about 33-36 feet, right?

20 meters, HALF wavelength, ~33 feet. Duh. Thanks for the correction.
(Though actually, I think that the "transmission line" portion should be
arbitrary in length and wouldn't need to be a quarter-wavelength.

> I've been trying to follow the discussion -- so has it been
> decided that the "transmission line" portion is actually
> forming a vertical emitter? Or is that just the sleeved
> portion beyond the coil?

I think the theory is that it's a coaxially-fed dipole: imagine a dipole where

one of the two halves is a metal tube; slip the coax through the tube and feed the antenna in the center, rather than bringing the coax up from the side. (Attach the tube the the braid of the coax.)

Now, because there is no electric field between the coax and the tubular conductor, you can shrink the tube until it touches the coax, and indeed, until it becomes the *outside* of the braid. OOPS: now that conductor is no longer a quarter-wavelength long (or if it is, it's grounded at your rig, which isn't right). SO, to force a high impedance to make the outside of the braid think it's been cut while the inside of the braid still conducts :-), coil the coax into an RF choke at that point. Ah, now I see why you would want another quarter wavelength section to the rig: being a quarter-wavelength long, it would transform the low-impedance ground at the rig into a high-impedance node at the "inner end" of the dipole. Hmm. That depends on *having* a decent ground at the rig, which might not be the case if you want a really portable antenna (hotel, etc.). A more effective choke (steel wool sleeve, lots of ferrite toroids, etc) might reduce the importance of enforcing the "virtual open" at that point.

> So what kind of tuner is needed? (tying into that
> discussion) Is this a hi or low impedance antenna?
> I'm guessing a low (nominally 50 ohm hopefully).

Probably "nominally" 50 ohms, though as I pointed out in another message, "50 ohms" is even more of a chimera than "75 ohms" (I think).

> Can someone photocopy the QST article? My library only
> keeps the most recent year, and my collection is also too
> recent.

What was the issue, I have them back to (oh heck when did I renew my ticket the first time...) 1987. (drat, or was it '89?)

73, John, WB7EEL

From ab4el.com Tue Aug 24 00:00:00 1994
From: "John F. Woods" <jfw@ksr.com>
Subject: Re: EGG ON MY FACE - Ingram's "whatever it is"

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Light, yes, but fairly lossy: 100' of RG-174 at 14MHz loses about 4.5dB (you'd need, what, 66 feet, not including the bare center conductor part?).

From ab4e1.com Tue Aug 24 00:00:00 1994
From: xenolith@halcyon.com (Kevin Purcell)
Subject: Re: EGG ON MY FACE - Ingram's "whatever it is"

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>"adequate research." Then again, a nice long thread developed.
> 1/73, Ade
```

Thats Mike not Novemeber. I have this problem all the time on phone or even face to face with my funny accent :-)

ASCII graphics follow for the RFD thingie:

$\left| \leftarrow \text{----- } 1/4 \text{ wave } \rightarrow \right| \left| \leftarrow \text{----- } 1/4 \text{ wave } \rightarrow \right|$
 $\text{=====} || \text{=====}$
 $\wedge$ coax $\wedge$ coax inner extended by 1/4 wave wire
 coax coiled so as to form a choke

The more I look at this the more I have my doubts that it works! It would be nice to now how effcient it is comapre to a vertical dipole.

Anyone tried one made from RF-174. It might make a excellent portable aerial.

Hope this helps!

72/73

Kevin Purcell, N7WIM / G8UDP xenolith@halcyon.com 206/649-6489
Seattle dBug Mac Developers SIG organiser

From ab4el.com Tue Aug 24 00:00:00 1994
From: "John F. Woods" <jfw@ksr.com>
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> design and a ref. to a QST article. I still can't quite visualize it
> as a variety of "sleeve" or "bazooka". Will have to check the ref.

Amusingly enough, I had no trouble visualizing it, because I had just purchased a 440MHz HT, and was trying to figure out what kind of antenna to use in place of the rubber duckie; I had just settled on a coaxially-fed dipole when the Ingram antenna was mentioned.

(Does anyone have a reference for an easily constructed HT-compatible antenna for 440MHz? I.e. a half-wave dipole is OK, but I don't want to try to hold up a 16-element Yagi one-handed... :-))

From ab4el.com Tue Aug 24 00:00:00 1994
From: CCS_MAH@ADMIN.FANDM.EDU
Subject: Re: FCC regulation of the interned

I thought you were serious up to the description of the licensing requirements. This post is as good as the one about the "superconducting antenna" with 120 db gain that ran on Ham-ant last april.

Seriously, though, increased regulation is not out of the question. Check out the very disturbing article "'Crackers': A serious threat" in the Chronicle of Higher Education, 8/17/94, page A23.

73 Mark KA3LFG

From ab4el.com Tue Aug 24 00:00:00 1994
From: mvjff@mvubr.att.com (James M Fitton +1 508 960 2577)
Subject: HW-8

Recently some folks were discussing duplicating an HW-8.

I would like to point out a few differences between the HW-8 and Century 21 in case anyone is interested.

The Century 21 has all the features of the HW-8 (DC Receiver etc...) plus the following:

- - Larger Size
- + 10 Meter Band
- + RIT
- + Built in Power Supply

- + Speaker
- + Jack for adding a Xtal calib.
- + RF gain control
- + 500 Hz Audio Filter
- + Full QSK (no relay)
- + Dial lamps
- + 0 - ~30 watts output adjustable
- + Finals protected from high SWR

It seems that all those mods designed for the HW-8, already exist on the C-21.

It is however a large rig.....

73/72 Jim Fitton, W1FMR QRP-NE mvjif@mvubr.att.com

From ab4el.com Tue Aug 24 00:00:00 1994

From: howie cahn <wb2cpu@world.std.com>

Subject: INET radio??

I've been off this list for about a month and missed most of the discussion about an INET rig, so please excuse me if I ask questions and bring up points that have already been covered. I was wondering what the perceived need for a new radio is? The low end is well covered by NorCal and 40/40-type rigs, and, at the other end of the QRP spectrum, the KK7B radios (R2, T2, etc.) get better performance at the expense of circuit complexity. There are plenty of other designs somewhere in between. So why reinvent the wheel?

I have my own ideas about why a new kind of radio design is needed but they go against the philosophy of many QRPers. I start with the premise that, in spite of the talk here, and the many construction articles, very few hams actually build their radios -- even QRPers! Look at contest results published in QRP Quarterly. Even though you get lots of points for using homebrew stuff in the ARCI contests, only a fraction of the list reports using any. Part of the problem is that many don't have the experience or expertise needed. For them, the NorCal or NN1G radios are a good place to start. The larger problem is that even those who are competent to design and build things are faced with a choice: if you build any of the designs presented, you're giving up on the performance and convenience found in even the low-end mainstream commercial transceivers -- things like passband tuning, digital readouts, memories, and DSP. It shouldn't be surprising that most choose the commercial stuff. I'd like to propose a way to bridge the gap by suggesting how to

get commercial-quality performance and features in a way that could get people involved in homebrewing.

The basic idea is that, instead of trying to go back to simple designs and components, we should take advantage of the newer technologies. This involves:

a. Using modern, more integrated components to make circuits simpler. I'm thinking of things like RF op amps and IF, DSP, and DDS chips. (See my article in the Aug. '94 QST on DDS.)

b. Using a PC to do the control functions needed for the kind of features contained in the commercial transceivers, described above. The main difference between homebrew radios and commercial transceivers is that the transceivers have built-in processors to control the displays, memories, synthesizers, etc. Most ham shacks already have one or more computers. Instead of having to design an embedded processor and program it in machine code, why not use the computer you have and that can be programmed in an easier, high-level language? Another difference between homebrew and commercial rigs is that the commercial transceivers have all kinds of expensive front panel components like weighted tuning knobs connected to shaft encoders, LED/LCD readouts, etc. These can all be replaced by simulating a front panel on the computer screen, creating a so-called 'virtual radio'. This is the trend in modern electronic equipment.

c. Architect the equipment in a modular way so that you can build parts of it and buy the rest. The modules (IF strips, frequency synthesizers, etc.) would either be available from within the ham community, or, would be standard computer boards. For example, there's an article in this month's QEX that talks about using a programmable SoundBlaster-type board for ALL the radio audio functions. In addition to basic audio output you could get DSP receive audio filtering, quadrature audio components for SSB generation, packet and other modems -- all by programming a single sound board. Most people buy computers with sound boards anyway now, again, why not take advantage of it for your radio?

I realize that most people here will disagree with this approach. If we stick to what we've been doing hams will become further split into two camps: those who build simple, technically-backward radios, and, those who buy their transceivers and don't have a clue what's in it? I'm working on some equipment incorporating the approach I described that should be published in magazine articles next year. Anyone want to work with me?

72/73... howie
wb2cpu@world.std.com

From ab4el.com Tue Aug 24 00:00:00 1994

From: N8ET@delphi.com

Subject: Inet rig / R2/T2

I have also been following this discussion with some interest, both because I am interested to see what comes out of it, and also because the R2/T2 keeps popping up, and I have a very definite interest in them (see my catalog - HI!)

Anyway - to answer a few question about the R2/T2.... As is is shipped it will perform from about 80m to 432 - limited at the low end by the power splitter, and at the high end by the SBL-1 mixer. By proper substitution of those two parts, the R2/T2 can be used from about 25 Khz to 1 GHz.

The instructions (article copy) do include info on how to wire the T2 for the various modes - it is just a matter of how you connect the phasing section. It also hints at being able to use it for some advanced digital modes , again, by properly inputting the digital signal and connecting the phasing as needed. (Don't ask me how yet - I have not gotten that far yet!)

The vfo that KK7B has recommended to me and has used in his rig is the vfo used by W7EL in his "Optimized QRP Transceiver" and also by W7Z0I in the "Ugly Weekender". Again - I have not had time to build on up to try - but I believe that is what was in the 40 meter R1 he loaned me some time ago, and the drift was negligible in my shack over a 30 minute period.

I have also thought about the Technowhizzy as a VFO. From what I understand, it would work, but performance of the radio would be compromised because of the spurs, etc, that are produced by an 8 bit dds circuit. As the dds stuff evolves, and they get to 12 and 16 bits, things get much better.

On a multiband R2/T2 - This is difficult to do because of the sensitivity to the phase and amplitude adjustment of the two signals coming from the local oscillators.

Finally - I would love to see the R2/T2 as part of the Inet rig - but please do not include that as input to any final decision about what is done. (Again - see my catalog - HI!)

If there are any other questions about the R2/T2/miniR2, I'll do my best to answer them - just send me an e-mail.

To those that are still waiting the first shipment - only one more backordered part to go, and then they hit UPS.....

And as a parting teaser - someone mentioned (Gary perhaps) that there was probably an individual out there quietly going ahead with all of this. I know of at least one (not me - but I hope to produce it when done...) - and I am looking forward to seeing what is developed - it will use the R2/T2.....

Is there anyone else out there who is taking some of these ideas and melting some solder??

back to my kits.....

72/73 - Bill - N8ET
Kanga US
n8et@delphi.com

From ab4el.com Tue Aug 24 00:00:00 1994
From: James Lyons <jlyons@CAM.ORG>
Subject: Re: Ingrams end-fed dipole--any users?'

On Tue, 23 Aug 1994, Adrian Weiss W0RSP English Department wrote:

> Craig:
> On second glance, the title is interesting: "resonant feedline". Another
> misnomer of sorts. Any feedline is "resonant" once a tuner has cancelled out
> the reactive component of the wave traffic on the line. The entire system
> including feedline and antenna is resonant, or tuned to the frequency of
> operation. 73 again, Ade
>

I think he means that the outer of the coax (or the currents flowing thereon) are choked at a resonant length. I think his design is something like a sleeve fed quarter wave. I guess it may have some merit in certain locations where it might be more convenient than the "normal" doublet.

I've seen other designs where the feeder on a doublet was choked at $1/4$ lambda to introduce some vertical radiation from the outer of the coax feedline. never tried it so don't know if it works.

72, Jim, VE2KN

From ab4el.com Tue Aug 24 00:00:00 1994
From: kilgore@tivoli.com (Jeff Kilgore)
Subject: Interested HB newcomer

Hello,

I have been watching this from the sidelines. I have no HB experience, but am interested in acquiring such experience, and hopefully some usable gear as well in the process. I did build a fair number of Heathkits back in the early 70's, and enjoyed it immensely.

I would be particularly interested in CW or CW/SSB designs for 50 MHz or 432 MHz. While I have no special design expertise to offer, I am a technical writer by trade and would be glad to assist in any way I can (documentation, etc.).

73,
Jeff, KC1MK

From ab4el.com Tue Aug 24 00:00:00 1994
From: stark <mswmod@sage.unr.edu>
Subject: Re: Internet rig ruminations

On Thu, 25 Aug 1994, Kevin Purcell wrote:

> >On Wed, 24 Aug 1994, todd (t.w.) nichols wrote:
> >
> >> Hi all,
> >>
> >.....etc.....
> >>
> >> 72,
> >> Todd
> >>
> >> PS - Anyone interested in surface mount?
> >
> >
> >Yes. I would love to see a cw rig that will fit into a 35mm film can.
> >
> >73's, Ron
>
> I'd like to see a SSB rig in a 35mm film can :-)
>
> A bit more of a challenge and doable I think!
>
> Kevin Purcell, N7WIM / G8UDP xenolith@halcyon.com 206/649-6489
> Seattle dBug Mac Developers SIG organiser
>

I think a SSB rig should be built into the mic.

73's, Ron,

.....KU7Y.....
.....Monte "Ron" Stark.....
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> Todd Nichols Bell Northern Research, Ottawa, Ontario (613) 765-3560
> tnichols@bnr.ca
> KB0HQV/VE3 BNR didn't say it; I did

73's, Ron

.....KU7Y.....
.....Monte "Ron" Stark.....
.....Sun Valley, Nevada.....

From ab4el.com Tue Aug 24 00:00:00 1994
From: Mike.Czuhajewski%hambbs@wb3ffv.ampr.org (Mike Czuhajewski)
Subject: Micro SSB rig?

Someone wants to see an SSB rig in a 35mm can? Doable? Perhaps. All I know for sure is that WA5JAY did build a 20M SSB rig (with VFO) in a 3 X 3 X 3/4 box (shown in the Idea Exchange in the QRP Quarterly a couple years back), and also built a CW transceiver with VFO into a bottle with a volume considerably less than the 35mm can. Maybe I should mention this one to him....

- - -
Mike Czuhajewski, user of the UniBoard System @ wb3ffv.ampr.org
E-Mail: Mike.Czuhajewski%hambbs@wb3ffv.ampr.org
The WB3FFV Amateur Radio BBS - Located in Baltimore, Maryland USA
Supporting the Amateur Radio Hobby, and TCP/IP InterNetworking

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>3 X 3 X 3/4 box (shown in the Idea Exchange in the QRP Quarterly a
>couple years back)

I remember seeing a picture in the color section at the front of QST of a

SSB "spy" TxRx (built for a "spy" TxRx competition) that was enclosed in a cigarette packet (the type with the folding up lid).

It was built by a Canadian ham. I should try to dig it up.

Is he on the list?

Kevin Purcell, N7WIM / G8UDP xenolith@halcyon.com 206/649-6489
Seattle dBug Mac Developers SIG organiser

From ab4el.com Tue Aug 24 00:00:00 1994
From: dgf@netcom.com (David Feldman)
Subject: Re: Micro SSB rig?

>Someone wants to see an SSB rig in a 35mm can? Doable? Perhaps. All
>

Not quite 35mm can size, but I remember from a handbook (or mag article) of the late 60s or early 70s a 20M SSB rig, all solid state, that ran off 6V, and put out about 350mW. Does anyone remember this article, and where might I find a copy?

73 Dave WB0GAZ dgf@netcom.com

From ab4el.com Tue Aug 24 00:00:00 1994
From: NYOUNG@DESIRE.WRIGHT.EDU
Subject: More musings on the NN1G

Ok, here's the deal: The following statements about signals levels and all that must be considered against the simple fact that I keep better records and remember more things about typology in language and language acquisition in general than I do things electronic. SO.....

The rig in question is the NN1G kit from Dan's SP&K, the 30m model. IF is 4.032, the oscillator has to run from 6.068 to 6.118 MHz to pull a mix at 10.10 through 10.150. My oscillator runs 6.068 to 6.114 or thereabouts. Everything is stock, no slug tuned inductors or other stuff. I have a barely useable receiver and a non-functional transmitter.

Tuning the receiver with a signal from the TR7 at lowest output into a DL works like it should. That is, I can peak the coils in T1, T2 and

T4. That much is ok, except that signals easily audible on the TR7 are in the mist on the NN1G.

Tuning the transmitter gets me a peak signal as I listen on the TR7, but no movement of the milliwatt swr/power meter.

Now, check this out: tuning the transmitter, I noticed that T5 tuned for a peak, but T6 tuned with a dip in the middle and peaks on either side. I check this on a scope and found that either side of that dip and especially with the slug all the way in, the waveform was pretty messy. The scope is a tektronics good to 50 MHz. So.... I turned T6 around and then it peaked. Very small signal out of that filter set, by the way. And the signal from the first transistor after the filter, Q4, was low. As in limbo low.

The questions then come up: what are my chances that I have the coils in backwards all the way around? I followed the documentation that came with the kits and even drew the documentation pictures on the schematic. So how come T6 works better turned around from the documentation? Makes you wonder, don't it.

By the way, I had to pad the hell out of C12 to get the tx L0 to come into the receiver BFO range for a reasonable sidetone. And it's very weak, kibo perry. Very weak, the sidetone, young skywalker.

(I am thinking about this in this direction: the LCK transciever looks a lot like the NN1G. Both use the NE602 in mixer and BFO/Product detector. But the NN1G uses the familiar [to me] MC1350 IF chip. The difference in price (Summer Sale at Dan's, the NN1G was about \$43, versus the LCK at \$70) made the decision for me. Since it took me 7 years to get the Howes kit running, I can put this one aside and wait until something else comes up that'll reenergize me about QRP on 30m. I'm even toying with the idea of getting the boards for the NN1G, a handful of toroids [of appropriate value] and the 10.1 MHz IF cans and trying it again my own way.... very sloooooow. So any hints or suggestions will probably be the tie breaker. I mean, we're down to the third inning and I'm standing by the last wicket here, folks. I'll get it running by Monday coming up or I'll put it in the box with the other catastrophes. Not much energy left now, captain. We'll be dead in the water very soon.)

73

Nils

WB8IJN &c

El que busca la salida no entiende el laberinto.

"Han proevde aa loefte hodet for aa se bedre; men da sank han tilbake i putene og mumlet med et inderlig fornoeyd smil: <<Vi kommer send - - hr. kunsel! men vi kommer godt!>>

From ab4el.com Tue Aug 24 00:00:00 1994
From: Stephen Trier <sct@po.cwru.edu>
Subject: Multi-band R2/T2

The trick to a multi-band R2/T2 may be to use the R2 and T2 as the IF in a superhet rig. That removes some of the advantages of the direct-conversion rig, since the system complexity will be on the order of a double- or triple-conversion superhet. Maintaining the high dynamic range seems like the biggest challenge. It would still have the advantages of the R2 audio stages.

Stephen

- - -

Stephen Trier The photovoltaic cell is not an electronic device
sct@po.cwru.edu in the accepted sense, since the conduction through
KG8IH it occurs in a semiconductor....
 - Standard Handbook for Electrical Engineers, 1941

From ab4el.com Tue Aug 24 00:00:00 1994
From: mont@netcom.com (Mont Pierce)
Subject: Re: Multi-band R2/T2

>
> Regarding RF quadrature generation for the phasing RX and TX:
>
> If you can generate the L.O. at 4X the desired frequency, you can generate
> very accurate quadrature signal with a couple of flip-flops properly
> connected in a divide by 4 configuration. The caveat to watch for is

Okay, I get the general idea. But can you be more specific on how to do this, I can't quite get the image to focus in my mind... :)
Is there an example of this somewhere?

tnx & 72,
km6wt

- - -

Mont Pierce

```
+-----+
| Ham Call: KM6WT                   Internet: mont@netcom.com       |
|    bands: 80/40/20/15/10/2       |
|    modes: cw,ssb,fm              |
+-----+
```

From ab4el.com Tue Aug 24 00:00:00 1994
From: Stephen Trier <sct@po.cwru.edu>
Subject: Re: Multi-band R2/T2

Mont Pierce writes:

> Are you saying that it would be better to do the above then have multiple
> switched in phasing networks for the local oscillator?

If you can maintain the tight phase relationship needed over several octaves of frequency, you're right, having several broadband phasing networks would be a superior approach. It comes down to a tradeoff of the loss in performance caused by the extra mixer versus the loss in performance caused by greater phase error in the L0.

Rick's article says that in an R2/T2 transceiver, it's usually better to split the L0 before phase shifting it, to remove the effect of any phase shift in the splitter. If you use band-switching phase shift networks, you will need two networks for every band.

> I am hoping that the bandwidth of a phasing network will be wide enough
> for one band with the help of varactors that are tuned at the same time
> as the local oscillator...

I thought a passive RC phase shift network is usually good enough for most of a ham band. I guess we'll all find out when our R2s and T2s arrive, eh? :-)

One technique that looks promising is a form of phase-lock loop. It has the usual RC phase shift network, but one of the C's is a varactor. The varactor voltage is set by an op amp which is comparing a potentiometer "balance" control to the low-pass-filtered output of a mixer mixing the two output signals. A mixer with two identical-frequency inputs outputs a DC component proportional to the phase difference between the signals. The pot sets the desired DC component, and the op amp does what is necessary to keep it there. This approach is mentioned in passing by the ARRL handbook.

This loop approach will introduce some phase noise, which will have to be taken into consideration.

Stephen

- - -

Stephen Trier

The photovoltaic cell is not an electronic device

Subject: Re: Multi-band R2/T2

Regarding RF quadrature generation for the phasing RX and TX:

If you can generate the L.O. at 4X the desired frequency, you can generate very accurate quadrature signal with a couple of flip-flops properly connected in a divide by 4 configuration. The caveat to watch for is that you need to use really fast rise-time devices. This limits how high you can make this scheme work. The quadrature accuracy suffers when the frequency gets too high. Below this frequency limitation the quadrature generation is very wideband and accurate. I've got some notes on this somewhere, but the previous comments are what comes to mind at the moment.

Ray WB6TPU
raymonda@uranium.ebay.sun.com

- ----- Begin Included Message -----
... text deleted ...

Are you saying that it would be better to do the above then have multiple switched in phasing networks for the local oscillator? I guess if the actual bandwidth of a given phasing network is too small then this would not be too easy. I am hoping that the bandwidth of a phasing network will be wide enough for one band with the help of varactors that are tuned at the same time as the local oscillator, but I haven't tried out any of this yet.

Rick, or anyone with R2 experience, can you give us an idea of the bandwidth of the phasing networks you've used?

For those of you who are unfamiliar, the R2 requires two local oscillator inputs, one of them is 90 degrees out of phase from the other.

72,
km6wt
- - -
Mont Pierce

```
+-----+
| Ham Call: KM6WT           Internet:  mont@netcom.com |
|   bands: 80/40/20/15/10/2 |
|   modes: cw,ssb,fm        |
+-----+
```

- ----- End Included Message -----

From ab4el.com Tue Aug 24 00:00:00 1994
From: N8ET@delphi.com
Subject: Re: Multiband R2/T2

As I understand it from reading Rick's articles, the phasing networks he describes are adequate for any single amateur band. They can be switched, but the problem that arises then is that the ratio of the amplitude of the two 90 degree signals will probably change. That will cause performance to degrade. (note the adjustment pot at the point the signals are recombined - it is there to adjust for any amplitude imbalance. It would have to be re-adjusted every time you switched bands...

If I can ever get these orders out, and find my soldering iron, I'll try a couple of the phasing circuits (including the 4x one) and see how they work.

Has anyone used one of the Motorola MC1648 oscillator chips?? It has a built in agc loop and derlivers 0dbm at 50 ohms....It would need some amplification to make the R2/T2 play, but mmic's should do that. Anyone know what the freq specs on the 1648 are??

72/73 - Bill - N8ET
Kanga US
n8et@delphi.com

From ab4el.com Tue Aug 24 00:00:00 1994
From: NYOUNG@DESIRE.WRIGHT.EDU
Subject: NN1G questions and the FCC on Internet

First off, the slug tuned coil didn't work. I found four places where I could get a signal into the TR7 on 10.100. I don't know if it was harmonics or what, but I discovered that not only could I get 10.10 on the receiver in two places, it was in four places on the output, and none of them deflected the wattmeter. I suspect that I have been tuning harmonics, birdies and mixer by-products, the kind of things that they put in those little sausages that they sell at good biker bars. You know the kind. Read the label and somewhere in there it will say "Beef, beef lips and beef by-products." Anyway, that's that. Glad I am that I have a box full of tiny little ceramic trimmers in sizes from juniors to queen size.

Twoth, I believe that I have misplaced the documentation on the NN1G. Having put this beast together, I think that I could easily put

another on another band just by buying the boards. Only thing I'd need are the transformer cans, the toroids and more patience than I can muster even on 50mg of Elavil daily. Progress reports as they occur.

Threeth, thanks to all who have sent encouragements. At least this one won't sit on a shelf for 7 years like the Howes kit did.

Fourth, all we need now is licensing for Internet. Socialized medicine I can understand, what with a Nordic heritage and all. But government meddling on Inet is gonna be like the old telephone deal all over again. Why, they (as in FCC & similar SRASMJs [email me for a definition]) most certainly will muck up this comm line so nicely as to make me go back to writing letters! On paper! And mailing them! To Chicago! Where they'll sit in warehouses!
J. R. "Bob" Dobbs was right: "You'll pay to know what you really think!"

73

Nils

WB8IJN &c

Lower subchain ex-post-factotum paranoid high priestling of Fnarg
(and other rantings too numerous to exfoliate)

From ab4el.com Tue Aug 24 00:00:00 1994
From: jfj@pacer1.usca.scarolina.edu (John F. Jarvis)
Subject: QRP (lack of) QS0s

After following the discussions in this group for a while,
it is clear why making 2*QRP QS0s is so hard these days: too
many QRPers are having Email QSOS instead of radio QS0s.

73 John , KE2WB

From ab4el.com Tue Aug 24 00:00:00 1994
From: K7YHA@aol.com
Subject: QRP Vol-I & II

Vols-I & II have been mailed out to KE6JZD & KE6BWJ on 8-25-94

I still have a few copies of both volumes left. Get 'em while they're hot!

\$30 for the set
\$15 for Vol-I
\$20 for Vol-II

Checks or money orders payable to:

Rich Arland
25 Amherst Ave
Wilkes-Barre, PA 18702

PS for Lynn, KE6JZD: just spent 3 days with a team from SCI-Pittsburg learning all about gangs. Be glad you moved! Pitt has their fair share of problems!
72 Rich

From ab4el.com Tue Aug 24 00:00:00 1994
From: Adrian Weiss W0RSP English Department <AWEISS@charlie.usd.edu>
Subject: R.F. Currents on Outside of Shield Braid

I mentioned in a previous posting that r.f. currents flowing on the outside of the coax shield braid are induced by the radiated field. I forget to add the qualification that this is generally true when a balun is used. Otherwise, the unbalanced line feeding the balanced antenna results in currents on the outside of the braid. However, if I recall correctly, the magnitude is microscopic compared to the currents flowing inside the shield. I remember seeing the figures 1:1000 and 1:10,000 as a measurement established range -- in some article somewhere. 73, Ade

From ab4el.com Tue Aug 24 00:00:00 1994
From: Mike.Czuhajewski%hambbs@wb3ffv.ampr.org (Mike Czuhajewski)
Subject: Re 35mm rig

All right...some wiseguy asked if it includes the battery. This has not yet been publicized anywhere--it's still between me and the originator and in its infancy--but since someone brought up THAT subject, here's the full Challenge as it stands (and yes, a battery IS involved).

The rig is to be built in one of those little fuse containers. If a VFO is involved, it must be internal. Connectors are not mandatory, as was the case with the DB25 rigs--you can bring things out on wires and cables if desired. But there's more, which no one has heard about yet--there are actually TWO containers allowed. If the fuse tin doesn't appeal to you, the other container is a 9V battery case. This means the standard 006P or whatever transistor radio battery, not one of those old style, BIG 9V batteries. The guts are to be removed and a rig built inside; but since the amount of volume is so large by

comparison to the fuse tin, the "battery rig" MUST be self powered! You may remove as many of the cells inside as you wish, but the remaining cells must be capable of powering the rig for on-the-air QSOs. I've seen two different types of 9V batteries--one has long, tubular cells while the other has flat, brick-like cells. I'd much prefer the latter, since they leave a rectangular space, which is much easier to build into. By the way, Robbie (WG3R) said that if I wanted I could make my own container with the same internal volume as a 9V battery (I have access to the machine shop at work), but the requirement remains that it be self-powered. Surface mount parts ARE allowed in these rigs.

All of this is quite serious, and I am not making up any of this as I go along. Robbie and I discussed this a few weeks ago at our QRP Show and Tell at Md. Radio, and everything I've said above, including the bit about the battery, was already settled long ago. Is this achievable? Most emphatically YES! I've seen what WG3R and WA5JAY did on the DB-25 Challenge, and surface mounts were specifically forbidden on those. Is any of this really practical? Probably not, but we'll have a great deal of fun with it!

73 and Queue Our Pea DE WA8MCQ

- - -

Mike Czuhajewski, user of the UniBoard System @ wb3ffv.ampr.org
E-Mail: Mike.Czuhajewski%hambbs@wb3ffv.ampr.org
The WB3FFV Amateur Radio BBS - Located in Baltimore, Maryland USA
Supporting the Amateur Radio Hobby, and TCP/IP InterNetworking

From ab4el.com Tue Aug 24 00:00:00 1994
From: janderson@polycom.com
Subject: Re: Re: Antenna experiments

John:

I like your example of a situation where field strength, max forward power, and minimum SWR fail to coincide. I'd like to add the following thoughts:

- o I don't think you'd ever see a 55 ohm "resistive" load looking into the 50 ohm transmission line, unless by chance the antenna had a just the right impedance (55 ohms?), and we were at just the right spot along the transmission line where the impedance is resistive only, without any reactive component.
- o There will be some point where power transfer is

maximized, but, assuming that the above statement is true, this will not be the OPTIMAL power transfer (this will only occur if the transmitter is seeing a 55 ohm RESISTIVE load (assuming the transmitter source impedance has no reactive component), and I think it would be difficult to find a point that represented 55 ohms resistive load).

- o A question I'll pose, since I don't know the answer: in the above stated case, will maximum (though not OPTIMAL) power transfer occur at the SWR dip minimum (note: not 1:1)? I think it would, but I'm not sure.
- o Another note: many swr bridges (such as 4 port hybrids) use 50 ohm resistors connected to their "measurement" ports. Does that mean that the SWR readings are meaningless when meters such as these are used in non-50 ohm systems (such as a 55 ohm xmtr and antenna)? Or can we think of these resistors as being, say, two resistances in a 4-R bridge, and since the other two resistances are equal (that is, in this case, the source and antenna resistances - both 55 ohms), would we still measure the correct SWR?

By the way - I stand corrected regarding tuner heating. Several people have mentioned noticable (and indeed catastrophic!) heating in some instances.

- Jeff, WA6AHL

From ab4el.com Tue Aug 24 00:00:00 1994
From: lhalliday@creo.bc.ca
Subject: Re[2]: Multi-band R2/T2

Ray Anderson writes about using flip-flops and the 4th harmonic of the desired frequency to produce quadrature L0 signals for R2/T2 and similar devices...

As said earlier, this works fine as long as the logic can keep up - - it's certainly a handy way to do it for low-to-mid HF if you use high-speed CMOS or Schottky logic. The division by 4 even cuts down on L0 drift!

You need to be careful to keep the wiring symmetric, even on HF - assuming a velocity factor of 0.66 in your connecting wires,

having I and Q wires 4cm different in length will cause a one degree phase error on 20m. This is significant in a phasing exciter.

The polyphase receiver in EW&WW last year showed sideband suppression of 50-60 dB up to 10 MHz, with gradual degradation from there. The author attributed this primarily to RF phase errors from not-sufficiently-symmetric wiring.

73 from Burnaby,
laura VE7LDH

From ab4el.com Tue Aug 24 00:00:00 1994
From: Mike.Czuhajewski%hambbs@wb3ffv.ampr.org (Mike Czuhajewski)
Subject: Rig in 35mm can??

So Monte Stark (KU7Y) would like to see a CW rig in a 35mm can??? Go back and check the April 1990 issue of the QRP Quarterly--four of us built rigs, two were transmitters and two were full blown transceivers with direct conversion receivers (one of them PHASING!), with built-in VFOs, and these were all done in little plastic bottles which quite literally rattle around loose inside 35mm film cans. (It was called the DB-25 Challenge. By the way, the originator has come up with a new challenge this month--build something into one of those little metal boxes with sliding plastic tops that packs of 5 cartridge fuses come in. In this case, the no-SMD rule has been rescinded!) 73 and Queue
Our Pea DE WA8MCQ

- - -
Mike Czuhajewski, user of the UniBoard System @ wb3ffv.ampr.org
E-Mail: Mike.Czuhajewski%hambbs@wb3ffv.ampr.org
The WB3FFV Amateur Radio BBS - Located in Baltimore, Maryland USA
Supporting the Amateur Radio Hobby, and TCP/IP InterNetworking

From ab4el.com Tue Aug 24 00:00:00 1994
From: xenolith@halcyon.com (Kevin Purcell)
Subject: Re: Rig in 35mm can??

>Mike Czuhajewski writes:
>>By the way, the originator has come up with a new
>>challenge this month--build something into one of those little metal
>>boxes with sliding plastic tops that packs of 5 cartridge fuses come
>>in. In this case, the no-SMD rule has been rescinded!)
>
>Is that with the battery?

>
>Hmm... an NE-602 and a 7400!
>
>-- Bruce

Someone recently showed in "72" and reprinted in the QQ that most earphones are *very* sensitive (he used the argument that the hi Z phones were better, but I found more interesting that they have roughly the same power sensitivity, so you just have to match impedances and modern Sony phones will work fine).

The upshot was that you could hear lots of signal using a SBL-1 as a product detector and NO amplification. In his example he used a step up transformer to get a good match to the 4k phones.

It is amazing how little you can do to get a good RX.

Probably has better performance than a NE602 too :-)

Kevin Purcell, N7WIM / G8UDP xenolith@halcyon.com 206/649-6489
Seattle dBug Mac Developers SIG organiser

From ab4el.com Tue Aug 24 00:00:00 1994
From: btoback@netcom.com (Bruce Toback)
Subject: Re: Rig in 35mm can??

Mike Czuhajewski writes:

>By the way, the originator has come up with a new
>challenge this month--build something into one of those little metal
>boxes with sliding plastic tops that packs of 5 cartridge fuses come
>in. In this case, the no-SMD rule has been rescinded!)

Is that with the battery?

Hmm... an NE-602 and a 7400!

- -- Bruce

From ab4el.com Tue Aug 24 00:00:00 1994
From: Mike.Czuhajewski@hambbs@wb3ffv.ampr.org (Mike Czuhajewski)

Subject: Simple vs. complex rigs

Congrats to WB2CPU on his QST article! He makes a good point about choosing between simple, "technically backward" homebrew gear and commercial gear with all its bells and whistles, but for a lot of us that is precisely the point--building small, simple rigs is part of the fun of ham radio/homebrewing/QRP. (Ask Doug DeMaw why he is heavily into musket loading guns and wearing buckskin when he could be shooting at targets with Uzis while wearing Goretex!) For me, at least, part of the fun is playing with small, simple, uncomplex rigs; if I want high performance for some demanding application like working DX or contesting I can turn on my TS-430S (which is, admittedly, far from state of the art today), but there is still a lot of fun for a lot of folks in being able to push back the Yaecomwood and connect the antenna to something scarcely bigger than a QSL card and make contacts hundreds of miles away. And how about pushing back the TS-430S and making contacts with a little rig that, quite literally, rattles around inside a 35mm film can? Now THAT was fun. And how about the tiny rig with a tiny, miniature CW on top of it? I only had ten contacts with that one but that was a blast. With all due respect to the engineering types out there, one reason we build simple rigs is that we enjoy building simple rigs. When we need higher performance we can slap down the money easily and buy something vastly superior to what we built. Somehow I can't get too excited about having a QRP rig that I control from my '286 computer; that would take about 95% of the fun out of it. 73 and Queue Our Pea (and all flames gladly entertained) de WA8MCQ

- - -

Mike Czuhajewski, user of the UniBoard System @ wb3ffv.ampr.org
E-Mail: Mike.Czuhajewski%hambbs@wb3ffv.ampr.org
The WB3FFV Amateur Radio BBS - Located in Baltimore, Maryland USA
Supporting the Amateur Radio Hobby, and TCP/IP InterNetworking

From ab4el.com Tue Aug 24 00:00:00 1994
From: howie cahn <wb2cpu@world.std.com>
Subject: Re: Simple vs. complex rigs

On Thu, 25 Aug 1994, Mike Czuhajewski wrote:

> Congrats to WB2CPU on his QST article! He makes a good point about
> choosing between simple, "technically backward" homebrew gear and
> commercial gear with all its bells and whistles, but for a lot of us
> that is precisely the point--building small, simple rigs is part of the
> fun of ham radio/homebrewing/QRP. (Ask Doug DeMaw why he is heavily
> into musket loading guns and wearing buckskin when he could be shooting
> at targets with Uzis while wearing Goretex!) For me, at least, part of
> the fun is playing with small, simple, uncomplex rigs; if I want high

> performance for some demanding application like working DX or
> contesting I can turn on my TS-430S (which is, admittedly, far from
> state of the art today), but there is still a lot of fun for a lot of
> folks in being able to push back the Yaecomwood and connect the antenna
> to something scarcely bigger than a QSL card and make contacts hundreds
...stuff deleted...
> Somehow I can't get too excited about having a QRP rig that I control
> from my '286 computer; that would take about 95% of the fun out of it.

Well, I understand what you're saying. The thing that most QRPers have in common is the realization that if you go out and buy a commercial, high power radio, working stuff isn't that difficult and challenging, and therefore, not that interesting or much fun. So we impose rules on ourselves to make things more difficult. The obvious one is staying below five watts. Some of us make things even more challenging by adding even more rules -- milliwatting, going all homebrew, using 'simple' equipment, scrounging parts from old TVs, etc., are some of the ways we do this. There's no right and wrong here. Each individual decides which of these restrictions to follow to make things interesting for them. If using a computer violates your sense of how you want to operate, fine. I don't (and never have) owned a 'Yaecomwood' to fall back to when QRP gets too difficult (ok, I had a Drake 2B receiver in the '60s). That's the way I'm playing the game to make things interesting to me. To me, using a commercial transceiver is about as exciting as using a VCR. My goal is to create as much of a high-performance homebrew, QRP as I can. If that involves using a computer to make it doable, that's fine with me.

When you go beyond the (relatively small) QRP community, other hams aren't necessarily looking for the same kind of challenges. Most DXers and testers aren't going to give up the performance and convenience that they're used to in their rigs. If you're going to convince them to go homebrew you have to offer them a way of getting these features in homebrew gear. I think the approach I suggested does this.

72/73... howie
wb2cpu@world.std.com

From ab4el.com Tue Aug 24 00:00:00 1994
From: N8ET@delphi.com
Subject: Super Tee Tuner / Long Wire Tuner....

I have been sort of following the discussion on the tuners the past few days - - at least where the Super Tee tuner is concerned. Someone mentioned a diagram - since I sell the kit, and it has been published in various forms in at least 3 publications that I am aware of, I will make my first attempt at an ascii diagram on the internet and try to put a schematic of sort on

[illegible]

A bit of explanation.....
the "3"s in the top left are a trifilar wound 4:1 step down transformer.
The "n"s accross the top are inductors wound on toroids. Although I did not
show it, there are 7 of them, and there is an SPST switch accross each so
that each can be switched in and out of the circuit. There are no taps, and
therefore no shorted turns involved.
The variable cap at the right is really 2 365 sections in parallel, and
there is also (not shown) the capability of switching in two more 330 pf
fixed mica caps in parallel with the variable cap.
The two output point as shown feed a balanced line. To feed a high
imperdance long wire, ground the lower point and feed the wire with the upper
point. To feed a low impedance long wire (or coax) - feed it directly from
the lower point.
A ground will be tied to the "_____"s in all cases.

Now that I have thoroughly confused everyone - it is in readable format in SPRAT #72 (Autumn '92), QRP Quarterly June '92, (both by W3TS I beleive), and

the original article by DJ2LR was in Dec. 1974 QST. Seems like it was also in QRPp.

72/73 - Bill - N8ET
Kanga US
n8et@delphi.com

From ab4el.com Tue Aug 24 00:00:00 1994
From: Adrian Weiss W0RSP English Department <AWEISS@charlie.usd.edu>
Subject: Re: Thanks (was Ingram's end-fed dipole -- any users?)

Clark:

No. The r.f. current travels on the inside skin of the coax shield braid. Even in the high-mismatch situation, no r.f. currents generated by the transmitter flow on the outside of the shield. The r.f. fields are kept inside the coax -- that's why it is called "shielded braid". When r.f. currents do appear on the outside of the braid, they are usually induced by the field radiated by the antenna. That is why many writers suggest running the coax away from the antenna at a right angle -- the null area in the spherical wave pattern. 73, Ade

From ab4el.com Tue Aug 24 00:00:00 1994
From: Adrian Weiss W0RSP English Department <AWEISS@charlie.usd.edu>
Subject: Re: Thanks (was Ingram's end-fed dipole -- any users?)

Hi Clark:

I'll try to answer your questions.

1) In regard to the coax-dipole limiting operation to the band for which it is cut, I was assuming the typical installation. The rise in popularity of coax as a feedline was partly due to the fact that one didn't need an antenna tuner. Connecting the low-impedance (50-70-Ohms) coax to the center of a halfwave dipole produced a "natural" match. The current distribution on a halfwave exhibits a maximum at the center, hence a relatively low impedance (ratio of voltage to current) appears at the feed terminals which happens to be in the general vicinity of 70-Ohms. The environment affects the actual impedance.

Nonetheless, hooking 72-Ohm coax to the center of a halfwave dipole produces only a very slight mismatch. Using 52-Ohm coax slightly increases the degree of mismatch but the SWR should be around 1.6:1. Any move off the exact resonant frequency of the antenna increases the degree of mismatch, but on 40-meters and higher bands [10m c.w., 10m phone], the bandwidth is less than about 5-percent of the design frequency. So, if a dipole

is cut for the middle of 40-m, somewhere around 7150, the SWR will rise as the frequency is moved out toward either edge of the band. Still within tolerable limits though. On 80-m, a dipole cut for a middle frequency of 3.75-Mhz will exhibit an SWR of about 5 at band edges, but here bandwidth is about 13% of center frequency. Most of us are horrified by a 5:1 SWR although actual ohmic loss in high-quality feedline is fairly negligible for short runs. We'd all prefer cutting the dipole for our favorite frequency (3560 or 3540) and live with whatever we get way off the QRP frequencies.

The current maximum condition obtains whenever the feedline is inserted either a quarterwave, or an odd multiple of a quarter wave, from one end of the antenna. You can have a very long side (5 quarterwaves) working against a 1 quarterwave side with the same match as a halfwave.

2) Your practice of feeding the coax thru a tuner and using the 80-meter dipole on lower bands is not the typical way of doing it since you're using a feedline/antenna combo intended to eliminate the tuner from the system. BUT, there is nothing wrong with this approach. It is a matter of what happens on the lower bands. First off, when you put the 80-m dipole on 40-m and adjust the tuner for best SWR between rig and tuner, you've achieved a conjugate match which causes all reflected power to be re-reflected back toward the antenna and eventually radiated. The whole system is then resonant and the antenna is as efficient a radiator as environment etc. permit. The fly in the ointment is the increased loss due to SWR on the transmission line. By operating the 80-m dipole on 40-m, you have connected a low-impedance coax (52- or 72-Ohms) to a voltage maximum on the antenna. The antenna impedance may be in the vicinity of 600-Ohms (or whatever) while the characteristic impedance of the coax is widely different. The SWR formula Z_r/Z_c shows a 12:1 SWR. What this means is that, as reflected current sums vectorally with incident current, a quite high current flow in both directions along the feedline occurs. Every trip back and forth subjects the wave energy to more ohmic-loss and dielectric-loss in the coax.

High-quality coax minimizes the loss that results. But it can be "bad" at this degree of mismatch. For example, ball-parking from the graph in an old ARRL Antennabook, if your coax exhibits a loss factor of 0.4dB for 100-ft, an additional 1.5db (approx) SWR loss can be expected. Now, 1.5dB doesn't sound like much, but my feeling, after copying a million "in the mud" QRP signals, is that I would have really appreciated just a teeny bit more! The audio types tells us that 3dB is about the minimum difference that the average ear can detect, but I know I can detect less than that. And I've watched K1PBW, the old 160m DX hound, hear and copy DX signals that my ears could not even sense. So, 1.5dB can make a difference in some situations.

So, using the 80-m dipole on lower bands by feeding the coax thru a tuner certainly will work. And the antenna will radiate with some gain over a dipole. That in part may offset a minor portion of the SWR loss in the coax, but you're still handicapping yourself. If you're satisfied, stay with it.

As far as the balun question is concerned, multitudes of hams have used coax-fed dipoles without a balun. Lab tests show that a balun has two beneficial effects: 1) equalization of currents in the two halves of the dipole (they can differ widely without a balun), and 2), elimination of currents on the outside of the coax shield. The basic flaw in the coax-fed dipole is that you're feeding a balanced antenna with an unbalanced feedline. The balun ("BALanced to UNbalanced") corrects that "flaw." By eliminating coax shield currents (usually picked up from the antenna's field), the radiation pattern is smoothed up to look more like drawings in the books. I don't know if a balun makes any difference in practice -- my antennas worked about the same with and without.

Hope this clarifies a few points. 73, Ade

From ab4el.com Tue Aug 24 00:00:00 1994
From: xenolith@halcyon.com (Kevin Purcell)
Subject: Re: Thanks (was Ingram's end-fed dipole -- any users?)

>> Now, just curious, if I use the tuner - isn't the coax now part of the
>> antenna and the shield radiating? Does this change the situation (much?)
>
>Not necessarily; mere use of a nonresonant antenna with coax (tuner or not)
>doesn't induce the coax to radiate, but I don't know offhand what situations
>do cause it. I'm pretty sure the tuner doesn't change whether or not the
>coax radiates, however.

Feeding a balanced aerial (!) with an unbalanced feeder will cause currents to flow on the outside of the coax braid. There is a good discussion of this in "Reflections" and there was also an article in the last year in QST which dealt with this "problem". The point is the RF skin effect means that there are three RF currents to be interested in: one on the inner conductor of the coax; one on the inside of the coax braid and one on the outside of the coax braid. Adding a choke to a feedline (by coiling the coax) only chokes the RF current on the outside of the braid. Remember the RF inside the coax is in a transmission line and knows nothing about what is happening outside of the feedline.

The flip side is: why worry? The current on the outside of the braid radiates too. In fact it is a vertical antenna (with a high feedpoint, too). So it will give a lower angle of radiation than that from the rest of the dipole. This has been taken advantage of in some antenna designs where the rf currents on the outside of the feedline are stopped by adding a choke (coiling the wire).

This is very similar to the RFD describe earlier that Ade didn't believe would work! The resonant bit is the outside of the shield is 1/4 wave long - -- a fancy name for a funky kind of sleeve dipole, except that the "break at the bottom of the sleeve is provided by an RF choke rather than a break in the wire.

For more of these antenna check out Bill Orr's column in CQ over the last year. And of course the Antenna book. Anyone have the new edition yet?

Kevin Purcell, N7WIM / G8UDP xenolith@halcyon.com
Seattle dBug Mac Developers SIG organiser 206/649-6489

From ab4el.com Tue Aug 24 00:00:00 1994
From: "SLRC1::M405142" <M405142%SLRC1.decnnet@mdcgwy.mdc.com>
Subject: Wanted: HW-9. Will trade HW-8's.

Wanted: HW-9. I have a few HW-8's, will consider a partial trade?
Any condition, except flattened by D9'er (lightening damage ok, etc.).
State how many pieces, price. THX! N0XEU Matt (314) 962-1418 6-9:PM eves)

From ab4el.com Tue Aug 24 00:00:00 1994
From: jeffrey@math.hawaii.edu (Jeffrey Herman)
Subject: rcvr as field strength meter

I have no wattmeter nor SWR meter - I've always used my receiver as an FSM when tuning my antenna tuner. But something someone posted (think it was Kevin) makes me wonder if this method might give a bad reading: Suppose that as I'm adjusting the L and C on my tuner I tune for maximum signal as read on my receiver's S-meter; I might be getting a maximum reading not because the antenna/tuner/xmtr are properly matched, but rather the mismatch is so bad that the tuner is radiating RF (the tuner and rcvr are only separated by a few feet).

Is this situation possible? Might I actually be getting a high S-meter reading because the match is so bad that all the RF is being dissipated by the tuner?

Phooey. I'm not going to get any sleep tonight thinking about this.

Jeff NH6IL
